

AERMIC Update

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Outline

- History of AERMIC
- Reconstituted AERMIC
- Summary of AERMIC Activities
- Future plans for AERMOD – Overview

History of AERMIC

- AMS/EPA Regulatory Model Improvement Committee initially formed in 1991; charged to develop replacement for ISCST based on state-of-the-science
 - AERMOD promulgated Dec. 2006
 - Membership of “new” AERMIC committee:
 - Roger Brode, OAQPS, Co-chair
 - Jeff Weil, CIRES-NCAR, Co-chair
 - Akula Venkatram, UC-Riverside
 - Al Cimorelli, EPA Region 3
 - Bret Anderson, EPA Region 7
 - Vlad Isakov, EPA/ORD/AMD

Summary of AERMIC Activities

- New AERMIC committee has held two meetings in RTP (March and July 2008), with third meeting tentatively planned for mid-November
- AERMIC reviewed status of AERMOD modeling system and activities of AIWG at initial meeting
- Key priority for AERMIC has been the Urban formulation in AERMOD
- However, AERMIC recognized significant overlap among many issues, including Urban, Surface Characteristics and Met Data
- AERMIC also recognized opportunities to address many implementation issues by utilizing newly available data

Some AERMIC Recommendations

- AERMIC discussed issues associated with building downwash in AERMOD
 - Recommended incorporating building processing function within AERMOD
 - Eliminates need for separate BPIPPRM processor
 - Facilitates assessment of additional options for processing building information for PRIME, including alternative criteria for determining controlling structure; possibility of combining influences from multiple structures; and option for looping through all influencing structures
- AERMIC has developed an alternative implementation horizontal meander
 - Preserves centerline value from current implementation but eliminates upwind dispersion component
 - Could significantly optimize model runtime for some applications, especially for short-term design values
 - May require additional guidance on applicability for long-term averages
 - Considering implementation in AERMOD as a regulatory option
 - This approach is still under assessment

Some AERMIC Recommendations

- AERMIC has discussed the use of gridded prognostic meteorological with AERMOD and will provide science support for the development and evaluation of options related to this effort
 - Recommends implementing and testing approach of processing gridded met data as pseudo-observations through AERMET, in addition to approach currently implemented in MM5-AERMOD Tool
 - Recommendation to invite experts in gridded meteorological modeling community to next (or future) AERMIC meeting
 - Consideration of options to incorporate some non-steady-state characteristics in AERMOD modeling system, possibly driven by gridded meteorological model inputs

AERMIC - Future Plans for AERMOD

- Building on plans to enhance AERSURFACE by combining land cover and elevation data, AERMIC is developing an approach to address a wide range of issues by utilizing this data directly in the model
- Land cover and elevation data (SRTM-NED) will be fed directly to AERMOD to develop source-specific meteorology accounting for land cover and obstacle heights around source and met tower
- Meteorology adjustments will account for effect of urban canopy on wind profiles

Future Plans for AERMOD (cont.)

- This approach could eliminate many implementation issues, especially related to urban applications
 - No distinction between “rural” and “urban” sources
 - No requirement to estimate “effective” population as surrogate for urban influences
 - Spatial and temporal variability of urban heat island influence will be accounted for
 - Representativeness of met data will always be an issue, but influence of surface characteristic variability should be mitigated
- Considerable work will be required to implement this plan, including performance evaluations

Future Plans for AERMOD (cont.)

- Incorporating fuller range of data directly into AERMOD may eliminate need for preprocessors, including AERMAP, AERMET, and AERSURFACE (as well as BPIPPRM)
- Access to “raw” input data in AERMOD may allow additional enhancements, such as direction-specific “hill height scales” for terrain influences, currently not practical to implement
- New AERMOD structure will better accommodate future enhancements as new data sources emerge
- Downside is that this plan is not likely to speed up AERMOD!

Questions?

